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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/031,332	05/09/2002	Robert Tjarnstrom	000500-335	6478

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EXAMINER

LI, AIMEE J

ART UNIT

PAPER NUMBER

2183

DATE MAILED: 03/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/031,332

Applicant(s)

TJARNSTROM, ROBERT

Examiner

Aimee J Li

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 January 2002 and 09 May 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5/9/02 and 6/27/02.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

1. Claims 1-14 have been considered. Claims 1-14 have been amended as per Applicant's request.

Papers Submitted

2. It is hereby acknowledged that the following papers have been received and placed of record in the file: Foreign Priority Papers as received on 18 January 2002; Oath and Declaration as filed on 18 January 2002; Pre-Amendment as filed 09 May 2002; IDS as filed on 09 May 2002; IDS as filed 27 June 2002; and Change of address as filed 27 January 2003.

Specification

3. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

4. As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC. (See 37 CFR 1.52(e)(5) and MPEP § 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or REFERENCE TO A "MICROFICHE APPENDIX". (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
- (e) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.

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(2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.

(f) BRIEF SUMMARY OF THE INVENTION.

(g) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).

(h) DETAILED DESCRIPTION OF THE INVENTION.

(i) CLAIM OR CLAIMS (commencing on a separate sheet).

(j) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).

(k) SEQUENCE LISTING. (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc.)

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

6. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claim 4 recites the limitation "the means for handling temporary storage values". There is insufficient antecedent basis for this limitation in the claim.

9. Claims 9 and 10 recite the limitation "the process descriptor". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being taught by Shuler, Jr., U.S. Patent Number 4,912,629 (herein referred to as Shuler).

12. Referring to claim 1, Shuler has taught a processor architecture adapted to program languages operating with a sequential flow of instructions and handling data through use of simple values and lists and dynamically allocated arrays, and comprising

- a. An instruction holding means (Shuler column 6, lines 52-56 and Figure 4),
- b. A data memory means storing data objects (Shuler column 6, lines 52-56 and Figure 4), and
- c. Execution means, (Shuler column 6, lines 52-56 and Figure 4)
- d. Characterized by means for handling simple values and references to data objects in dependence of an actual instruction from the instruction holding means, said dependence being called a binding (Shuler column 6, lines 16-40; column 6, line 52 to column 7, line 23; Figure 2; Figure 3; and Figure 4);
- e. Means to increment reference counts to a data object and to decrement reference counts to a data object in dependence of an actual instruction from the instruction holding means (Shuler column 3, line 60 to column 4, line 10; column 5, lines 8-41; Figure 2; and Figure 3), and
- f. In dependence of the means, which handles simple values and references, storing a reference to said data object (Shuler column 6, lines 16-40; column 6, line 52 to column 7, line 23; Figure 2; Figure 3; and Figure 4).

13. Referring to claim 2, Shuler has taught

- a. Characterized by means for handling storage of simple data and references to data objects in the means, said stored data and references to data objects being referred to, by means of identifiers, from instructions from the instruction holding means (Shuler column 6, lines 52-23);
- b. Storage means in the means for handling storage of simple data and references to data objects (Shuler column 6, lines 52-56; column 6, line 16 to column 7, line 23; Figure 2; Figure 3; and Figure 4).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 3-10 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shuler, Jr., U.S. Patent Number 4,912,629 (herein referred to as Shuler) as applied to claim 1 above, in view of Zee, U.S. Patent Number 4,530,049 (herein referred to as Zee). Shuler has taught

- a. Characterized in that the means for handling the storage of values comprises a parameter memory means having means for keeping notice of the bindings to the stored values (Applicant's claim 3) (Shuler column 6, lines 52-56; column 6, line 16 to column 7, line 23; Figure 2; Figure 3; and Figure 4), and

- b. Then bond to certain identifiers in the instructions (Applicant's claim 5) (Shuler column 6, lines 52-56; column 6, line 16 to column 7, line 23; Figure 2; Figure 3; and Figure 4), and
 - c. Said data values are arranged to be read from the parameter memory in dependence of said identifiers in an actual instruction (Applicant's claim 5) (Shuler column 5, lines 8-41).
 - d. Characterized by a set of instructions comprising dedicated instructions for incrementing or decrementing the number of references to data objects stored in the data memory (Applicant's claim 13) (Shuler column 3, line 60 to column 4, line 10; column 5, lines, 8-41; Figure 2; and Figure 3).
16. In regards to Shuler, Shuler has taught that there are specific function codes which initiate the process followed by the garbage manager. This is similar to a call function, since it is one instruction to initiate a sub-group of processes followed internally by the garbage manager to perform its operations. Shuler has not taught
- a. Having storage means for storing said values (Applicant's claim 3).
 - b. Characterized in that said storage means in the means for handling temporary storage of values stores values, which comprises at least type information and value information (Applicant's claim 4).
 - c. Characterized in that the parameter memory is used to transfer and store function arguments, such that argument values are stored in the parameter memory in dependence of an actual instruction from the instruction holding means (Applicant's claim 5),

- d. Characterized by means in the parameter memory for storing and managing scope information for the stored parameters, where the scope information determines which parameters are currently valid and eligible to be read out from the storage (Applicant's claim 6).
- e. Characterized by means in the parameter memory for storing and managing information for scope and values, where the means is used for storing and managing information for scope and data values, where the process information determines which scopes and values are currently valid and eligible to be read out from the storage (Applicant's claim 7).
- f. Characterized by a process identification register for identification of the currently executed process; a scope identification register for identification of the currently valid scope (Applicant's claim 8).
- g. Characterized in that at least the top of at least one priority queue of processes to be executed is kept available for reading; and that at least part of the process descriptor of the next process to be executed is kept available for reading (Applicant's claim 9).
- h. Characterized in that in order to make a process switch the means for handling values and references (Applicant's claim 10):
 - i. Creates a new scope and at least the program counter is stored in the parameter memory using said new scope (Applicant's claim 10);

- ii. Stores said new scope value in the process descriptor of the current process, said process descriptor may be stored in the data memory (Applicant's claim 10);
 - iii. Restores the scope value for the process switch from the process descriptor of said process (Applicant's claim 10);
 - iv. Sets the process switch to be the current process (Applicant's claim 10);
and
 - v. Reads at least the program counter from the parameter memory and performs the restoring (Applicant's claim 10).
- i. Adapted to execution of languages using functions and dynamic memory allocation characterized by a set of instructions comprising dedicated instructions for making function calls, function returns, and parameter transfer between functions (Applicant's claim 12).
 - j. Characterized in that it is adapted to process parts of computer programs written in a functional language (Applicant's claim 14).
17. Zee has taught
- a. Having storage means for storing said values (Applicant's claim 3) (Zee column 2, lines 15-23; column 4, lines 47-54; column 5, lines 1-3 and 57-68; Figure 1; and Figure 7).
 - b. Characterized in that said storage means in the means for handling temporary storage of values stores values, which comprises at least type information and

- value information (Applicant's claim 4) (Zee column 2, lines 15-23; column 4, lines 47-54; column 5, lines 1-3 and 57-68; Figure 1; and Figure 7).
- c. Characterized in that the parameter memory is used to transfer and store function arguments, such that argument values are stored in the parameter memory in dependence of an actual instruction from the instruction holding means (Applicant's claim 5) (Zee column 2, lines 15-23; column 4, lines 47-54; column 5, lines 1-3 and 57-68; Figure 1; and Figure 7),
- d. Characterized by means in the parameter memory for storing and managing scope information for the stored parameters, where the scope information determines which parameters are currently valid and eligible to be read out from the storage (Applicant's claim 6) (Zee column 6, lines 25-59; Figure 1; and Figure 7).
- e. Characterized by means in the parameter memory for storing and managing information for scope and values, where the means is used for storing and managing information for scope and data values, where the process information determines which scopes and values are currently valid and eligible to be read out from the storage (Applicant's claim 7) (Zee column 6, lines 25-59; Figure 1; and Figure 7).
- f. Characterized by a process identification register for identification of the currently executed process; a scope identification register for identification of the currently valid scope (Applicant's claim 8) (Zee column 5, lines 1-10; column 6, lines 25-59; Figure 1; and Figure 7).

- g. Characterized in that at least the top of at least one priority queue of processes to be executed is kept available for reading, and that at least part of the process descriptor of the next process to be executed is kept available for reading (Applicant's claim 9) (Zee column 4, lines 22-29; column 6, lines 25-59; Figure 1; and Figure 7).
- h. Characterized in that in order to make a process switch the means for handling values and references (Applicant's claim 10):
 - i. Creates a new scope and at least the program counter is stored in the parameter memory using said new scope (Applicant's claim 10) (Zee column 3, lines 45-68; column 4, lines 10-29; column 5, lines 57-89; column 6, lines 25-59; Figure 1; and Figure 7);
 - ii. Stores said new scope value in the process descriptor of the current process, said process descriptor may be stored in the data memory (Applicant's claim 10) (Zee column 3, lines 45-68; column 4, lines 10-29; column 5, lines 57-89; column 6, lines 25-59; Figure 1; and Figure 7);
 - iii. Restores the scope value for the process switch from the process descriptor of said process (Applicant's claim 10) (Zee column 3, lines 45-68; column 4, lines 10-29; column 5, lines 57-89; column 6, lines 25-59; Figure 1; and Figure 7);
 - iv. Sets the process switch to be the current process (Applicant's claim 10) (Zee column 3, lines 45-68; column 4, lines 10-29; column 5, lines 57-89; column 6, lines 25-59; Figure 1; and Figure 7); and

- v. Reads at least the program counter from the parameter memory and performs the restoring (Applicant's claim 10) (Zee column 3, lines 45-68; column 4, lines 10-29; column 5, lines 57-89; column 6, lines 25-59; Figure 1; and Figure 7).
 - i. Adapted to execution of languages using functions and dynamic memory allocation characterized by a set of instructions comprising dedicated instructions for making function calls, function returns, and parameter transfer between functions (Applicant's claim 12) (Zee column 1, lines 12-24; column 3, lines 45-68; column 4, lines 10-29; column 5, lines 57-68).
 - j. Characterized in that it is adapted to process parts of computer programs written in a functional language (Applicant's claim 14) (Zee column 1, lines 12-24).
- 18. A person of ordinary skill in the art at the time the invention was made, and as taught by Zee, would have recognized that the call function system of Zee eliminates overhead (Zee column 2, lines 33-36) and reduces system competition (Zee column 2, lines 55-57), thereby improving system performance (Zee column 2, lines 33-36 and 55-57). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the call function system of Zee in the device of Shuler to improve system performance.
- 19. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shuler, Jr., U.S. Patent Number 4,912,629 (herein referred to as Shuler) as applied to claim 1 above, in view of InstantWeb's Free Online Computing Dictionary (herein referred to as FOLDOC). Shuler has not taught characterized by instructions having only one instruction format, where each

instruction is composed of a distinct number of sub-instructions, each of which has in turn the same and only one format comprising a first part and a second part, the first part determining the action to take and the second part providing a value to use in that action. FOLDOC has taught characterized by instructions having only one instruction format, where each instruction is composed of a distinct number of sub-instructions, each of which has in turn the same and only one format comprising a first part and a second part, the first part determining the action to take and the second part providing a value to use in that action (FOLDOC terms: VLIW, horizontal microcode, horizontal encoding, and superscalar). A person of ordinary skill in the art at the time the invention was made, and as taught by FOLDOC, would have recognized that VLIW processors execute more than one instruction at a time (FOLDOC term: superscalar), thereby increasing processing speed. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the VLIW of FOLDOC in the device of Shuler to improve processing speed.

Conclusion

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aimee J Li whose telephone number is (571) 272-4169. The examiner can normally be reached on M-T 7:30am-5:00pm.

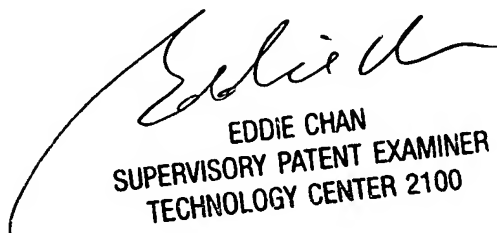
21. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on (571) 272-4162. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

22. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

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may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AJL
Aimee J. Li
20 March 2005



EDDIE CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100